ETHNOBIOLOGY LETTERS

Book Review

Sustainable Lifeways: Cultural Persistence in an Ever-Changing Environment

Naomi F. Miller, Katherine M. Moore, and Kathleen Ryan, eds. 2011. University of Pennsylvania Press, Philadelphia. Pp. 352, 73 illustrations. $65.00 (cloth). ISBN 9787934536193.

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Received: June 10, 2013
Published: July 23, 2013

Volume: 4:76-77

Atmospheric CO_2 levels have now passed what experts consider to be the critical threshold of 400 parts per million (ppm). The last time CO_2 concentrations were this high was several million years ago, during the mid-Pliocene. In the wake of this poignant landmark Naomi Miller, Katherine Moore and Kathleen Ryan's edited volume, *Sustainable Lifeways: Cultural Persistence in an Ever-changing Environment* is required reading for anyone thinking about how society can address the immediate and long term environmental risk and uncertainty we face.

The edited volume addresses three key questions: how do societies perceive environmental risk? How do they adapt to changing conditions? And in what circumstances have the most rapid and far reaching adaptations occurred? Contributors include archaeological and anthropological specialists working in West Asia, the American Southwest, East Africa and Andean South America with hunter-gatherer, cultivator and non-industrial agricultural groups. Robust paleoenvironmental records have been published for these regions, allowing this volume to address key questions through multiple lines of evidence at multiple time scales: long term (millennial); medium term (centuries to a few thousand years); and more recent (few years to decades).

The first chapter by Neil Roberts provides a good review of the proxy methods, such as stable isotopes and pollen, used by researchers interested in human-environmental interactions, from prehistory to the present. Using examples from dryland regions, a focus throughout this volume, Roberts concludes that proxy methods, applied cautiously, provide new insights that can help policy makers in the present understand changing environments, so long as it is understood that social responses are not predetermined in the past (p. 33).

Chapters 2 through 4 present ethnographic evidence of pastoralist strategies to buffer risk. Fiona Marshall and colleagues (chapter 2) present a counter point to what they perceive as a focus in environmental risk and resilience studies on sedentary agriculturalists. The authors demonstrate that East African pastoralists employed a range of economic, social and political mechanisms. Notably, mobility is employed as a key strategy to mitigate unpredictability. Similarly, Lois Beck and Julia Huang (chapter 4) use Beck's ethnographic observations (p. 107) to discuss the nomadic pastoralist adaptations of the Qashaqa'i in southwest Iran. They also identify mobility as an effective strategy to reduce the effects of environmental risk. Kathleen Ryan and Korega-Munene (chapter 3) used their observations of East African pastoralists to conclude that flexibility is fundamental to the success of this lifestyle (p. 75). By shifting emphasis from different types of livestock, pastoralists effectively 'spread the risk' – biologically, environmentally, and socially (p. 101).

Arlene Rosen (chapter 5) analyzes foraging strategies in the Levant from the Early Natufian through to the beginning of the Pre-Pottery Neolithic B (PPNB), arguing that hunter-gatherer strategies in the Near East did not steer a trajectory towards agriculture by design. Rather, Rosen shows that hunter-gatherers employed flexible and effective long term foraging strategies. Indeed, only with the climatic amelioration a millennium after the Natufians did agriculture replace hunter-gather lifestyles. Rosen is clear this was not just a matter of climate forcing social change, but rather the *push and pull* of climatic and social factors (p. 145).

Further emphasizing the potential of social mechanisms to buffer risk, Timothy Kohler and Charles Reed argue (chapter 6) that population growth, resulting from favorable climatic conditions in the American Southwest, led to a decrease in big game hunting efficiency during the Basketmaker III and Pueblo I phases (AD 600-900). This heightened risk prompted the intensification of big game hunting through the formation of more efficient kin-based hunting groups. Kohler and Reed suggest these patrilineal units were effective in warfare, and perhaps even a contributing factor in the emergence of social inequality in the American Southwest (p. 154).

Katherine Spielmann and colleagues (chapter 7) consider the environmental risks faced by Ancestral Pueblo farmers, addressing how these were mitigated through a variety of social and spatial scales: storage employed at the household level and food sharing at the community level. Short term emigration is identified as a buffering mechanism at the regional level. Notably, the authors show that in conditions of sustained drought permanent emigration from the affected region would be employed (p. 181). Traditionally, this behavior has been framed as "abandonments." However, they argue that migration is an effective buffering strategy and should be seen as part of a resilient system (p. 203).

Resilience should not be seen to always reflect the most *efficient* adaptation. It can reflect persistent traditional practice. Katherine Moore (chapter 9) demonstrates this through faunal analysis at four archaeological sites in the Titicaca basin. With data spanning the Early Formative through to the Late Intermediate period (1500 BC – AD 145), Moore shows that declining fish returns due to changing lake levels resulted in a shift towards agropastoralism. However, in spite of negligible returns, traditional fishing practices persisted.

Maria Bruno's chapter (8) is based on ethnographic fieldwork in the Titicaca basin. Bruno's findings show that resilience of Andean farming techniques stem from several sources: a sophisticated understanding and application of locale soil characteristics in the development of agricultural practice, flexible land use and a diverse economic system that includes herding and fishing (p. 237). Bruno suggests this knowledge should inform future farmers in the Titicaca basin in the mitigation of projected regional climate change (p. 213). These findings provide a useful analogy for archaeological interpretations of past adaptation to climate change.

Peter Stahl (chapter 10) considers risk mitigation strategies under the periodic but extreme disruption caused by volcanic activity in the Ecuadorian Andes. Persistent and repeated human occupation reveals an adaptation towards species that thrive in disturbed ecologies. Stahl suggests this commitment to a dangerous and volatile valley is best understood in terms of social context. Traditionally, the landscape is seen in Neotropical America as a gift from the ancestors, each generation indebted to the last (p. 302), creating a powerful link to a location and fostering a commitment to a risky environment.

Finally, Naomi Miller discusses the economic strategies adopted by the agropastoralists at Gordion in the central Anatolian steppe from the 3rd millennium BC through the Roman Period to a second medieval occupation (p. 310). Using plant macroremains and archaeofaunal assemblages Miller reconstructs trends in the mixed farming economy. Miller finds that, by employing a flexible agropastoral subsistence base, the inhabitants at Gordion could shift their economic emphasis from pastoral to agricultural elements, according to the prevailing physical and social conditions (p. 319).

Drawing together the large chronological and regional knowledge of the contributors, this work offers excellent case studies concerning human resilience and adaptation to risk, which can inform current decision making. Indeed, with the atmospheric CO_2 threshold surpassing 400 ppm, the archaeological and anthropological perspective on human responses to environmental unpredictability and the resultant food scarcity, expertly presented in this volume, has *never* been more relevant. This is archaeology at its policy-decision-informing best.